

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The Office Action dated December 29, 2006 has been received and its contents carefully reviewed.

Claims 1-20 are rejected by the Examiner. With this response, claims 1, 4, 8, 9 and 15 have been amended. Claims 6, 12, and 19 have been canceled without prejudice or disclaimer. No new matter has been added. Claims 1-5, 7-11, 13-18, and 20 remain pending in this application. Claims 1, 4, 6, 9 and 16 are objected to by the Examiner.

In the Office Action, claims 1-7, 9-13, 15, 16, and 18-20 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,002,563 to Nakamura (hereinafter "Nakamura"). Claims 8, 14, and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakamura in view of U.S. Patent No. 5,598,180 to Suzuki et al. (hereinafter "Suzuki"). Claims 1, 4, 6, 9 and 16 are objected to under 37 C.F.R. § 1.75(a).

The rejection of claims 1-5, 7, 9-11, 13, 15, 16, 18, and 20 under 35 U.S.C. § 102(e) as being anticipated by Nakamura is respectfully traversed and reconsideration is requested.

Independent claim 1 recites a liquid crystal display device having a combination of features including "wherein dummy pixel signals are applicable to the plurality of liquid crystal cells during a blanking period following the data apply period, wherein the dummy pixel signals represent a predetermined brightness level and wherein polarities of the dummy pixel signals representing the predetermined brightness level applicable to adjacent ones of data lines of the plurality of data lines are invertable by the data driver during the blanking period."

In the Office Action, the Examiner cites Nakamura as disclosing this combination of features recited in claim, in particular citing the waveform of V_{sj} illustrated in FIG. 4, and column 8, lines 42-58. Applicants respectfully disagree that Nakamura, including the portions cited by the Examiner discloses the above quoted combination of features recited in claim 1. For example the text cited by the Examiner describes the potential of the common or counter electrode. Nakamura states the following at column 8, lines 42-48:

"Moreover, the above-described embodiments explain that the counter electrode potential is inverted for every horizontal scanning period, as shown

in FIG. 9, but the invention is not limited to this, and is also applicable to the H/common inversion driving method in which the counter electrode potential is switched for every predetermined number of horizontal scanning periods.”

Similarly, FIG. 4 shows V_{sj} during the blanking period transiting from a voltage corresponding to the signal applied during the data apply period to a single, polarity desired potential. See Nakumura, column 7, lines 13-22. Accordingly, Applicants submit that Nakumura does not disclose at least “wherein polarities of the dummy pixel signals representing the predetermined brightness level applicable to adjacent ones of data lines are invertable by the data driver during the blanking period” as recited in claim 1. Accordingly, Applicants submit that claim 1 is not anticipated by Nakumura.

Independent claim 9 recites a driving method of a liquid crystal display device having a combination of features including “applying dummy pixel signals to the plurality of data lines during a blanking period following the data apply period, wherein the dummy pixel signals each represent a predetermined brightness level; and inverting polarities of dummy pixel signals representing the predetermined brightness level applied to adjacent ones of the plurality of data lines during the blanking period.”

In the Office Action, the Examiner rejects claim 9 using the same rationale used to reject claim 1. Applicants submit that Nakumura does not disclose at least “inverting polarities of the dummy pixel signals representing the predetermined brightness level applied to adjacent ones of the plurality of data lines during the blanking period” for reasons similar to those given for claim 1, and that accordingly, claim 9 is not anticipated by Nakumura.

Independent claim 15 recites a method of driving a liquid crystal display panel over a plurality of successive frame periods having a combination of features including “applying a plurality of dummy pixel signals to the n rows of liquid crystal cells during the blanking period” and “wherein the plurality of dummy pixel signals represent a predetermined brightness level and wherein the dummy pixel signals applied to adjacent ones of the plurality of data lines during the blanking period have opposite polarities.”

Applicants submit that Nakumura does not disclose at least “wherein the plurality of dummy pixel signals represent a predetermined brightness level and wherein the dummy pixel signals applied to adjacent ones of the plurality of data lines during the blanking period have

opposite polarities” as recited in claim 15. Accordingly, Applicants respectfully submit that claim 15 is not anticipated by Nakumura.

Claims 2-5, 7, 10, 11, 13, 16, 18, and 20 depend respectively from claims 1, 9, and 15, and each includes by reference all of the limitations from the respective base claims. Accordingly, Applicants respectfully submit that Nakumura does not anticipate claims 2-5, 7, 10, 11, 13, 16, 18, and 20, at least by way of the dependencies of the claims and for the reasons given for the respective base claims 1, 9, and 15.

The rejection of claims 8, 14, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Nakamura in view Suzuki is respectfully traversed and reconsideration is requested.

Claims 8, 14, and 17 depend respectively from claims 1, 9, and 15 and each include by reference all of the limitations from their respective base claims.

Applicants submit that Suzuki does not cure the deficiencies in Nakumura with respect to the features recited in claim 1, 9, and 15, and that Nakumura and Suzuki, analyzed singly or in combination do not teach or suggest the combined features of claims 1, 9, and 15. Accordingly, Applicants submit that claims 1, 9, and 15, and claims 8, 14, and 17 depending respectively from claims 1, 9, and 15 are each allowable over Nakumura and Suzuki.

Applicants note that the blanking period of Suzuki is a short period between two frames when the polarity of common electrode and the video signal are being reversed (See Suzuki, column 7, lines 50-55, and column 8, lines 16-26) while in the claimed invention the blanking period is during a portion of the a frame “each frame period includes a data apply period and a blanking period” during which a dummy pixel signal is a applied and during which the pixel maintains a data signal.

More specifically, the dummy pixel signal having a predetermined level is applied to all data lines within a portion of the frame period when the scanning signal is off. On the other hand, Suzuki is characterized by applying a constant signal for a blanking period BP in which the next frame is started after the end of a previous frame period. Applicants submit that the blanking period of Suzuki is not the same as the blanking period of the claimed invention and that a teaching in Suzuki to apply a while level signal during the blanking period of Suzuki does not cure the deficiencies in the teachings of Nakamura.

Applicants additionally submit that no motivation outside of the Applicants' specification has been provided to modify the structure of Nakamura with the teachings of Suzuki to make the combinations recited in claims 8, 14, and 17.

Claim 8 recites a liquid crystal display (LCD) device having a combination of features including "a data driver ... wherein the dummy pixel signals are applicable to the plurality of data lines by the data driver during the blanking period" and "wherein dummy pixel signals comprise a white signal." Claim 14 recites a driving method of a liquid crystal display device having a combination of features including "applying dummy pixel signals to the plurality of data lines during a blanking period following the data apply period, wherein brightness levels of the dummy pixel signals are substantially identical" and "further comprising applying the dummy pixel signals as white signals." Claim 17 recites a having a method of driving a liquid crystal display panel combination of features including "applying a plurality of dummy pixel signals to the n rows of liquid crystal cells during the blanking period" and "wherein the plurality of dummy pixel signals comprise white signals."

In rejecting claims 8, 14, and 17, the Examiner acknowledges in the Office Action that Nakamura does not teach "the dummy pixel signals being white signal as presently claimed." The Examiner cites Suzuki as allegedly curing this deficiency in the teaching of Nakamura. As motivation to modify the teaching of Nakamura with the teachings of Suzuki, the Examiner states that "Suzuki discloses an active matrix LCD comprising a control circuit inputting white-level signal to signal-line drive circuit IC, which applies a white level potential to each signal line during the blanking period in order to ensure no image being displayed during the blanking period." Applicants respectfully disagree with the Examiner's conclusion regarding the teaching of Suzuki. Suzuki states the following at column 8, lines 18-25:

"In this instance, the potential control circuit 20 (also, the other potential control circuit 20') are designed to input various signals (CONT, CLK, etc.) and the white-level signal (in the case of normal-white display) to each signal-line drive IC 10 during the vertical blanking period. Since no gate signals are input at all, no image can be displayed if the drive IC 10 applies only a white-level potential is applied to each signal line."

Applicants submit that Suzuki teaches that the avoiding displaying an image during the blanking period results from "no gate signals are input at all" rather than because of application of the white-level potential and that otherwise applying a white-level signal would not "ensure

no image being displayed during the blanking period” as suggested by the Examiner. Accordingly, Applicants submit that one of ordinary skill in the art would not be motivated by the cited teaching of Suzuki to make the combination recited in claims 8, 14, and 17 for the reason given by the Examiner, and that Examiner has not made a prima facie case of obviousness with respect to claims 8, 14, and 17 for at least this reason.

Applicants further submit that modifying Nakumura with the teachings of Suzuki as described by the Examiner would render Nakumura unsatisfactory for its intended purpose. MPEP 2143.01 states in part, “If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.”

Nakumura states the following regarding the purpose of the invention at column 3, lines 8-14:

“According to the present invention, the potential of each signal line can be suppressed from varying upon inversion of the counter electrode potential. Further, the consumption of power can be reduced. In addition, the variation range in the potential of each signal line can be reduced, and hence suppress the occurrence of a defective display due to the potential variations of the signal lines.”

Nakamura discloses the following as the means for accomplishing this purpose at column 6, lines 15-24:

“As described above, since all the signal lines are fixed to a desired potential, e.g. an intermediate potential in this embodiment, during the horizontal blanking period, variation in the potential of each signal line, due to the coupling of the counter electrode and the signal line, can be suppressed when the counter electrode potential is inverted, thereby reducing the consumption of power. Further, since the variation range of each signal line potential after the blanking period is small, the signal line can be promptly set at a desired potential.”

Applicants submit that setting the signal lines to a white signal at the maximum or minimum of the signal range rather than to the “intermediate potential” as described in Nakumura would destroy the ability of the invention in Nakumura to accomplish its function as described above. Accordingly, Applicants submit that Nakumura is not properly combined with Suzuki to make the combination recited in claims 8, 14, and 17 for at least this further reason.

The Examiner objects to claims 1, 4, 6, 9, and 16 under 37 C.F.R. § 1.75(a).

Regarding the objections to claims 1, 4, 6, and 9, these claims as amended do not recite the limitations objected to by the Examiner. Accordingly, Applicants respectfully request that the objection to the 1, 4, 6, and 9 claims be withdrawn.

The Examiner objects to claim 16 as failing to comply with 37 C.F.R. § 1.75(a). The text of 37 C.F.R. § 1.75(a) is as follows:

The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

The Examiner acknowledges, and Applicants agree, that the metes and bounds of claim 16 are determinable and that the claim complies with 35 U.S.C. § 112, second paragraph. 35 U.S.C. § 112, second paragraph requires that “The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.” Applicants submit that as claim 16 complies fully with 35 U.S.C. § 112, second paragraph, claim 16 of necessity also complies with the identical requirement in 37 C.F.R. § 1.75(a). Accordingly, Applicants respectfully request that the objection to claim 16 be withdrawn.

Applicants believe the foregoing amendments and remarks place the application in condition for allowance and early, favorable action is respectfully solicited.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37

C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

Dated: March 29, 2007

Respectfully submitted,

By


Valerie P. Hayes

Registration No.: 53,005

McKENNA LONG & ALDRIDGE LLP

1900 K Street, N.W.

Washington, DC 20006

(202) 496-7500

Attorneys for Applicants